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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/526.814 03/16/00 BALL

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JOSEPH A WALKOWSKI
TRASK BRITT & ROSSA
PO BOX 2550
SALT LAKE CITY UT 84110

MM92/0320

H.A.N

2814

EXAMINER

ART UNIT

PAPER NUMBER

DATE MAILED:
03/20/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/526,814

Applicant(s)

BALL, MICHAEL B.

Examiner

Nathan Ha

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 5-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 15-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-4 and 15-25 drawn to a semiconductor device, classified in class 257, subclass 786.
 - II. Claims 5-14, drawn to a method of making a semiconductor device, classified in class 438, subclass 175.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case unpatentability of the group I invention would not necessarily imply unpatentability of the group II invention, since the device of the group I invention could be made by processes materially different from those of the group II invention. For example, instead of routing the pad to the active surface, and then wire bonding the bond pads to the discrete pads, as set forth in claim 5, the structure may be made by forming the pad to the active surface, and then wire bonding the bond pads to the discrete pads simultaneously.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Atty. Walkowski on Feb. 28, 2001 a provisional election was made without traverse to prosecute the invention of group I, claims 1-4 and 15-25. Affirmation of this election must be made by applicant in replying to this Office action. Claims 5-14 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

5. Claim 23 is objected to because of the following informalities: the element "adaptor" should be changed to "adapter", in claim 23, line 2. Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-4 rejected under 35 U.S.C. 102(b) as being anticipated by Kim (US. 5,304,737)

In regards to claim 1, in figs 3 and 4, Kim discloses an apparatus for routing interconnections among bond pads on a semiconductor die comprising a sheet-like 11, non-conductive structure having a first surface, and a second surface for attachment to

a die 3, in fig. 3; and a plurality of electrically conductive discrete pads 12a attached to the first surface, the plurality of electrically conductive discrete pads electrically isolated from the second surface.

In regards to claim 2, Kim further discloses at least one conductor 12a extending between at least two of the plurality of electrically conductive discrete pads, see fig. 5.

In regards to claim 3, Kim further discloses at least one conductor 6a extending between at least two of the plurality of electrically conductive discrete pads, see also, col. 4, lines 10-21.

In regards to claim 4, the non-conductive structure 11 is comprised of a dielectric sheet, see col. 4, lines 40-43.

8. Claims 15-19 and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kata et al. (US. 5,905,303)

In regards to claims 15 and 17, in fig. 20B, Kata et al. discloses a die 1 including a plurality of bond pads 2 disposed on a surface thereof; and adapter having a first plurality of discrete electrical contacts 6 on a first surface S1 thereof, each electrically connected to one of the plurality of bond pads and the adapter having a second plurality of discrete electrical contacts 9 on a second surface S2 thereof, at least some of the second plurality of discrete electrical contacts in electrical communication with the first plurality of discrete electrical contacts; and a plurality of conductive bumps 9, each extending from one of the second plurality of discrete electrical contacts.

In regards to claim 16, Kim further discloses a protective coating over at least a portion of the die 1 and with the plurality of conductive bumps being at least partially exposed.

In regards to claim 18, it is inherent to have the thermal coefficient expansion of the chip that similar to that of the carrier in order to prevent the crack in the device when it operates under high temperatures.

In regards to claim 19, Kim further discloses the adapter comprising at least one conductive via 4 extending between at least one of the first plurality of discrete electrical contacts and at least one of the second plurality of discrete electrical contacts.

In regards to claims 21-22, the adapter is adhesively secured to the die, see fig. 19.

In regards to claim 23, some conductors 6 are internal to the adapter.

In regards to claim 24, adapter comprising a tape-like structure, fig. 17a.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kata et al. as applied to claim 19 above, and further in view of Higgins (US. 5,291,062)

In regards to claim 20, Kata et al. discloses all of the claimed limitations as mentioned above except at least some of the second plurality of discrete electrical contacts are electrically isolated from the bond pads disposed on the surface of the die. Higgins, in fig. 6, teaches at least some of the second plurality of discrete electrical contacts are electrically isolated from the bond pads disposed on the surface of the die 12 in order to have varied styles of circuit connections in a device and to eliminated the connection points as many as possible.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use Higgins in Kata in order to have varied styles of circuit connections in a device and to eliminated the connection points as many as possible.

11. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kata et al. as applied to claim 17 above, and further in view of Higgins.

In regards to claim 25, Kata et al. discloses all of the claimed limitations as mentioned expressly above except at least one of the second plurality of discrete electrical contacts is electrically interconnected with a second die. Higgins, in fig. 7, at least one of the second plurality of discrete electrical contacts 48 is electrically interconnected with a second die 102 in order to increase a number of I/O and more routing of electrical traces that required by multilayer technology, see col. 7 lines 54-65.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use Higgins in Kata in order to increase a number of I/O and more routing of electrical traces that required by multilayer technology.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan Ha whose telephone number is (703) 305-3507. The examiner can normally be reached on M-F 9:00-5:00(EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and 308-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Nathan Ha
March 14, 2001


OLIK CHAUDHURI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800